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Working Party on the Transport of Dangerous Goods

Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)

Fifteenth session
Geneva, 24–28 August 2009
Item 5 of the provisional agenda
Catalogue of questions

Gases — practice, objectives 1.1, 1.2, 1.3, 2, 3, 4, 5.1, 5.2

Transmitted by the Central Commission for the Navigation of the Rhine (CCNR)[1]

1. At its fourteenth session, the ADN Safety Committee, recalling that, under 8.2.2.7.2.3 of the Regulations annexed to ADN, the ADN Administrative Committee was required to prepare a catalogue of questions for the ADN examinations, decided that the item should be put on the agenda for future sessions, in order to enable lists of questions to be translated and adopted progressively (ECE/TRANS/WP.15/AC.2/30, paras. 38 and 40).

2. This document contains the lists of questions proposed by CCNR in respect of practices for the "gases" examination:

- Examination objective 1.1: Flushing — flushing in the event of a change of cargo
- Examination objective 1.2: Flushing — addition of air to the cargo
- Examination objective 1.3: Flushing — Methods for flushing (degassing) before entering cargo tanks
- Examination objective 2: Sampling

[1] Distributed in German by the Central Commission for the Navigation of the Rhine (CCNR) under the symbol CCNR/ZKR/ADN/WP.15/AC.2/2009/37.

- Examination objective 3: Dangers of explosion
- Examination objective 4: Health risks
- Examination objective 5.1: Measuring gas concentration — measuring devices
- Examination objective 5.2: Measuring gas concentration — use of measuring devices

Practice

Examination objective 1.1: Flushing

Flushing in the event of a change of cargo

Number	*Source*	*Correct answer*
GP 1101	Flushing in the event of a change of cargo	C
	The cargo tanks of a vessel contain propylene vapour at an overpressure of 0.2 bar (gauge) with no liquid. The vessel is to be loaded with propane. How would you begin the loading?	
	A By flushing the cargo tanks with nitrogen until the propylene content is less than 10% volume	
	B By flushing the cargo tanks with propane vapour until the propylene content is less than 10% volume	
	C In such a way as to prevent extremely low temperatures from being reached	
	D Very slowly to avoid low temperatures	
GP 1102	Flushing in the event of a change of cargo	C
	The cargo tanks of a vessel contain propylene vapour at an overpressure of 0.2 bar (gauge) with no liquid. The vessel is to be loaded with a mixture of propylene and propane. How would you begin the loading?	
	A By flushing the cargo tanks with nitrogen until the propylene content is less than 10% volume	
	B By flushing the cargo tanks with vapour from the mixture until the propylene content is less than 10% volume	
	C In such a way as to prevent extremely low temperatures from being reached	
	D Very slowly to avoid low temperatures	
GP 1103	Flushing in the event of a change of cargo	A
	The cargo tanks of a vessel contain butane vapour at an overpressure of 0.2 bar (gauge) with no liquid. The vessel is to be loaded with UN No. 1010 1,3-BUTADIENE, STABILIZED. How would you begin the loading?	
	A By flushing the cargo tanks with nitrogen until the butane content corresponds to the filler's instructions	
	B By flushing the cargo tanks with butadiene vapour until the butane content corresponds to the filler's instructions	
	C By filling a cargo tank with butadiene until an overpressure of approximately 2 bar (gauge) is obtained in the tank	
	D By directly loading the cargo tanks with liquid butadiene	

Number	*Source*	*Correct answer*
GP 1104	Flushing in the event of a change of cargo	A
	The cargo tanks of a vessel contain butane vapour at an overpressure of 0.2 bar (gauge) with no liquid. The vessel is to be loaded with UN No. 1086 VINYL CHLORIDE, STABILIZED. How would you begin the loading?	
	A By deep cleaning the cargo tanks	
	B By flushing the cargo tanks with vinyl chloride vapour until the butane content is 0% volume (no longer detectable)	
	C By filling a cargo tank with vinyl chloride until an overpressure of approximately 3 bar (gauge) is obtained in the tank	
	D By directly loading the cargo tanks with vinyl chloride liquid	
GP 1105	Flushing in the event of a change of cargo	D
	The cargo tanks of a vessel contain propane vapour at an overpressure of 0.2 bar (gauge) with no liquid. The vessel is to be loaded with butane. How would you begin the loading?	
	A By flushing the cargo tanks with nitrogen until the propane content is less than 10% volume	
	B By flushing the cargo tanks with butane vapour until the propane content is less than 10% volume	
	C By filling one cargo tank with butane vapour until an overpressure of approximately 2 bar (gauge) is obtained in the tank	
	D By directly loading the cargo tanks with liquid butane	

Practice

Examination objective 1.2: Flushing

Addition of air to the cargo

Number	*Source*	*Correct answer*
GP 1201	Addition of air to the cargo	D
	A vessel is to be loaded with UN No. 1978 PROPANE. The cargo tanks contain air. How would you begin the loading?	
	A By directly filling the cargo tanks with propane vapour	
	B By removing air from the cargo tanks by means of propane vapour	
	C By reducing the oxygen content in the cargo tank to 16% volume by flushing with nitrogen	
	D By reducing the oxygen content in the cargo tank to the level corresponding to the filler's instructions by flushing with nitrogen	
GP 1202	Addition of air to the cargo	C
	A vessel is to be loaded with UN No. 1077 PROPYLENE. The cargo tanks contain air. How would you begin the loading?	
	A By directly filling the cargo tanks with propylene vapour	
	B By removing air from the cargo tanks by means of propylene vapour	
	C By reducing the oxygen content in the cargo tank to the level corresponding to the filler's instructions by flushing with nitrogen	
	D By reducing the oxygen content in the cargo tank to 16% volume by flushing with nitrogen	
GP 1203	Addition of air to the cargo	B
	A vessel has just left the shipyard. The cargo tanks have been open. The valves are closed. The vessel is to be loaded with UN No. 1011 BUTANE. How would you begin the loading?	
	A By flushing the cargo tanks with nitrogen until the condensation point is below the required value	
	B By flushing the cargo tanks with nitrogen until the oxygen content in the cargo tanks has been reduced to the value required by the filler	
	C By flushing the cargo tanks with nitrogen until the oxygen content in the cargo tanks has been reduced to 16% volume	
	D By directly introducing butane vapour into the cargo tanks	

Number	*Source*	*Correct answer*
GP 1204	Addition of air to the cargo	B
	A vessel has just left the shipyard. The cargo tanks have been open. The valves are closed. The vessel is to be loaded with UN No. 1077 PROPYLENE. How would you begin the loading?	
	A By directly loading the cargo tanks with propylene	
	B By flushing the cargo tanks with nitrogen until the oxygen content in the cargo tanks has been reduced to the value required by the filler	
	C By flushing the cargo tanks with nitrogen until the oxygen content in the cargo tanks has been reduced to 16% volume	
	D By directly introducing propylene vapour into the cargo tanks	
GP 1205	Addition of air to the cargo	C
	A vessel is to be loaded with UN No. 1969 ISOBUTANE. The cargo tanks contain completely dry air at an overpressure of 0.1 bar (gauge). How would you begin the loading?	
	A By introducing isobutane into the cargo tanks until the overpressure reaches 2 bar (gauge)	
	B By removing air from the cargo tanks by means of longitudinal flushing with isobutane vapour	
	C By flushing the cargo tanks with nitrogen until the oxygen content in the cargo tanks has been reduced to the value required by the filler	
	D By flushing the cargo tanks with nitrogen until the oxygen content in the cargo tanks has been reduced to 16% volume	

Practice

Examination objective 1.3: Flushing

Methods for flushing (degassing) before entering cargo tanks

Number	*Source*	*Correct answer*
GP 1301	Methods for flushing (degassing) A cargo tank contains propane vapour, with no liquid, and the cargo tank is not under pressure. Which of the following methods for flushing under pressure results in the lowest final concentration? A Setting the overpressure to 7 bar (gauge) once, then releasing the pressure B Setting the overpressure to 3 bar (gauge) twice, then releasing the pressure C Setting the overpressure to 2 bar (gauge) three times, then releasing the pressure D Setting the overpressure to 1 bar (gauge) five times, then releasing the pressure	D
GP 1302	Methods for flushing (degassing) A cargo tank contains propane vapour, with no liquid, and the cargo tank is not under pressure. You wish to obtain a propane concentration of less than 0.5% volume. Which of the following methods for flushing uses the least nitrogen? A Setting the overpressure to 5 bar (gauge) three times, then releasing the pressure B Setting the overpressure to 3 bar (gauge) four times, then releasing the pressure C Setting the overpressure to 2 bar (gauge) five times, then releasing the pressure D Setting the overpressure to 1 bar (gauge) eight times, then releasing the pressure	D
GP 1303	Methods for flushing (degassing) What is meant by longitudinal flushing? A Raising the pressure in a cargo tank, then releasing the pressure B Simultaneously raising the pressure in several cargo tanks with nitrogen C Continually adding nitrogen to the cargo tank(s) and simultaneously releasing the overpressure D Simultaneously raising the pressure with nitrogen in the port and starboard cargo tanks	C

Number	*Source*		*Correct answer*
GP 1304	Methods for flushing (degassing)		A
	What is meant by flushing under pressure?		
	A	A repeated raising of pressure in one or more cargo tanks with nitrogen, followed by a release of pressure	
	B	An uninterrupted flow of nitrogen through several cargo tanks in a line	
	C	An interrupted flow of nitrogen through a cargo tank	
	D	An interrupted flow of nitrogen at high pressure through one or more cargo tanks	
GP 1306	Flushing (degassing) in connection with repair work		C
	A vessel has previously carried propane and is headed for the shipyard for soldering work on its cargo tanks. With what must the cargo tanks and piping be flushed?		
	A	No flushing is required	
	B	First with air and then with nitrogen	
	C	First with nitrogen and then with air	
	D	Only with nitrogen	
GP 1307	Flushing (degassing) in connection with entry into the cargo tanks		B
	A vessel has carried butane. The cargo tanks are to be entered. How should the cargo tanks be flushed?		
	A	With nitrogen until the concentration of butane is no more than 1% volume	
	B	First with nitrogen, then with air until there is no longer any oxygen deficiency	
	C	First with nitrogen, then with air, until the oxygen content reaches 6% volume	
	D	Directly with air until the oxygen content reaches 21% volume	
GP 1308	Longitudinal flushing		C
	Why is longitudinal flushing the most efficient method for flushing cargo tanks?		
	A	Because with a relatively weak flow of nitrogen, the heavier gas of the chemical to be vented is completely flushed out by the nitrogen and only a volume of nitrogen equal to the volume of the tank is thus used	
	B	Because with a relatively large flow of nitrogen, the gas and the nitrogen are completely mixed so that a considerable quantity of nitrogen is used, but the task is quickly done	
	C	Because the substituting of the gas with nitrogen in the initial stage and the mixing of the two gases in the final stage means less nitrogen is used than when flushing under pressure	

Number	*Source*		*Correct answer*
	D	Because it allows for advance calculation of the final concentration in the cargo tank of the gas to be vented, after a specific time period	
GP 1309	Deleted		

Practice

Examination objective 2: Sampling

Number	*Source*	*Correct answer*
GP 2001	Deleted	
GP 2002	Deleted	
GP 2003	Flushing/rinsing of test tubes	D
	What should be done with a test tube before a representative sample of liquid may be taken?	
	A The test tube should be rinsed with water	
	B The test tube should be flushed with dry air	
	C The test tube should be flushed 10 times with gas then plunged into water	
	D The test tube should be rinsed with the liquid to be sampled	
GP 2004	Flushing/rinsing of test tubes	A
	What should be done with a test tube before a representative sample may be taken of the gaseous phase?	
	A The test tube should be flushed with the gas to be sampled	
	B The test tube should first be filled with the liquid form of the chemical	
	C The test tube should be rinsed with a liquid	
	D The test tube should be rinsed with water	
GP 2005	Sampling during longitudinal flushing	A
	A tank vessel was previously loaded with UN No. 1011 BUTANE. The cargo tanks are empty and have not been cleaned. They are flushed using the longitudinal flushing method. Where is the highest concentration of butane measured during the flushing?	
	A High up in the cargo tank	
	B Halfway up the cargo tank	
	C At the bottom of the cargo tank	
	D In the gas piping	
GP 2006	Deleted	
GP 2007	Storage of samples in test tubes	A
	Where should a test tube used to sample a liquid be stored?	
	A In a protected location above deck in the cargo area	
	B In a cool location outside the cargo area	

Number	*Source*		*Correct answer*
	C	In a cofferdam	
	D	In the wheelhouse	
GP 2008			C
	Why is the gas concentration periodically measured while the cargo tanks are being flushed with nitrogen?		
	A	In order to determine whether the shore facility is effectively supplying nitrogen	
	B	In order to determine the oxygen content of the nitrogen	
	C	In order to monitor the progression of the flushing	
	D	In order to determine at what point the mixture of gases should be burnt off	
GP 2009	Deleted		
GP 2010			B
	After loading with UN No. 1077 PROPYLENE, a sample of liquid is taken at 50% of the fill height. Why?		
	A	For no reason	
	B	In order to assess the quality of the cargo	
	C	In order to measure the temperature of the liquid	
	D	In order to determine whether the shore facility has in fact delivered propane	

Practice

Examination objective 3: Dangers of explosion

Number	*Source*	*Correct answer*
GP 3001	Definition of explosive limit The concentration of gases in a mixture composed of flammable gas and air is below the lower explosive limit. What are the properties of this mixture? A It cannot ignite B It can burn, but not explode C It can explode but not burn D It can burn or explode	A
GP 3002	Definition of explosive limit The concentration of gases in a mixture composed of flammable gas and air is higher than the upper explosive limit. What are the properties of this mixture? A It cannot burn B It cannot dissipate C With the addition of air it can form an explosive mixture D It can explode	C
GP 3003	Definition of explosive limit A mixture of gases is composed of 6 volume per cent propane, 4 volume per cent oxygen and 90 volume per cent nitrogen. How explosive is this mixture considered to be? A Unsafe, since the concentration of propane is above the lower explosive limit B Unsafe, since the concentration of propane is higher than the upper explosive limit C Safe, since the concentration of propane is below the lower explosive limit D Safe, since the concentration of oxygen is too weak to ignite the mixture	D
GP 3004	Definition of explosive limit A cargo tank contains 20 volume per cent air and 80 volume per cent nitrogen. What forms in the cargo tank when it is loaded with isobutane? A A flammable mixture which could explode	D

Number	*Source*	*Correct answer*
	B An explosive mixture, since the oxygen content is sufficiently high	
	C An explosive mixture	
	D A mixture that is not explosive	
GP 3005	Definition of explosive limit	A
	A mixture of gases is composed of 10 volume per cent propylene, 18 volume per cent oxygen and 72 volume per cent nitrogen. How explosive is this mixture considered to be?	
	A Unsafe, since the concentration of propylene is within the explosive range and the concentration of oxygen is sufficiently high	
	B Unsafe, since the concentration of propylene is above the upper explosive limit	
	C Safe, since the concentration of oxygen is less than 21 volume per cent	
	D Safe, since the concentration of propylene is below the lower explosive limit	
GP 3006	Critical dilution rate	B
	A cargo tank contains a mixture of gases composed of 5 volume per cent propane, 5 volume per cent oxygen and 90 volume per cent nitrogen. Should this cargo tank be flushed with air?	
	A No, since the concentration of propane is within the explosive range	
	B No, since the concentration of oxygen will increase and the mixture will become explosive	
	C Yes, since the oxygen content in the cargo tank is less than 10 volume per cent	
	D Yes, since there is sufficient nitrogen in the cargo tank	

Number	*Source*	*Correct answer*
GP 3007	Critical dilution rate	C
	A cargo tank contains a mixture of gases composed of less than 2 volume per cent butane, 3 volume per cent oxygen and more than 95 volume per cent nitrogen. Should this cargo tank be flushed with air?	
	A No, since the concentration of butane is within the explosive range	
	B No, since, when diluted with air, the concentration of oxygen will increase and the mixture will become explosive	
	C Yes, since the concentrations of butane and oxygen are so low that if diluted with air, a non-explosive mixture is formed	
	D Yes, since the concentration of butane is below the lower explosive limit	
GP 3008		B
	Propane gas is under pressure in a closed system. The propane escapes through a small leak to the outside. What will happen to the propane gas?	
	A It will spontaneously combust	
	B It will mix with the air and form an explosive mixture	
	C Being a heavy gas, a high concentration will remain near the source	
	D It will not mix with the air but will rise unmixed	
GP 3009	Explosive limit and static electricity	D
	An area contains air with 5 volume per cent propane gas. A spark occurs as a result of a discharge of static electricity. Will the spark cause the propane/air mixture to ignite?	
	A No, since the ignition energy of the spark is too weak	
	B No, since the concentration of propane is too low	
	C No, since the concentration of propane is too high	
	D Yes, since the ignition energy of the spark is sufficient and the concentration of propane is within the explosive range	

Practice

Examination objective 4: Health risks

Number	*Source*	*Correct answer*
GP 4001	Imminent hazards Which of the following substances is toxic and corrosive and poses an imminent inhalation hazard? A UN No. 1005 AMMONIA, ANHYDROUS B UN No. 1010 1,2-BUTADIENE, STABILIZED C UN No. 1969 ISOBUTANE D UN No. 1978 PROPANE	A
GP 4002	Delayed effect Which of the following substances is carcinogenic? A UN No. 1005 AMMONIA, ANHYDROUS B UN No. 1010 1,2-BUTADIENE, STABILIZED C UN No. 1962 ETHYLENE D UN No. 1969 ISOBUTANE	B
GP 4003	Anaesthetizing effect Which of the following gases has an immediate effect via inhalation on the central nervous system and an anaesthetizing effect with prolonged exposure or at a high concentration? A UN No. 1011 BUTANE B UN No. 1969 ISOBUTANE C UN No. 1077 PROPYLENE D UN No. 1086 VINYL CHLORIDE, STABILIZED	D
GP 4004	Definition of the maximum workplace concentration What is meant by the maximum workplace concentration of a substance? A The maximum acceptable concentration for an unspecified period of exposure B The maximum acceptable concentration to safeguard health C The maximum permissible concentration of the substance in air at which even an exposure of	C

Number	*Source*	*Correct answer*
	eight hours per day and a maximum of 40 hours per week does not have adverse effects on health	
	D The acceptable average minimum concentration of the substance in air	
GP 4005	Definition of the maximum workplace concentration	C
	What is meant by the maximum workplace concentration of a substance?	
	A The average maximum acceptable gas concentration over time of the substance in air for 15 minutes and for not more than eight hours per day	
	B The average maximum acceptable gas concentration over time of the substance in air for one hour and not more than eight hours per day	
	C The maximum permissible concentration of the substance in air at which exposure for 8 hours per day and a maximum of 40 hours per week does not have adverse effects on health	
	D The average maximum acceptable concentration over time of the substance in air for one hour and not more than eight hours per week	
GP 4006	Exceeding the maximum workplace concentration	B
	A substance has a maximum workplace concentration of 1 ppm. What is the maximum amount of time a person can remain in an area where the concentration of the substance is 150 ppm?	
	A One minute	
	B The area should not be entered	
	C One hour	
	D Eight hours	
GP 4007	Maximum workplace concentration – odour threshold	A
	A substance has a maximum workplace concentration of 100 ppm and an odour threshold of 200 ppm. If the substance's odour cannot be detected in an area, what can be concluded with regard to health risks?	
	A It could be hazardous, since the maximum workplace concentration may be exceeded	
	B There is no risk, since the concentration is less	

Number	*Source*	*Correct answer*
	than the maximum workplace concentration	
	C There is no risk, since the concentration is higher than 200 ppm.	
	D It is hazardous, since the concentration is higher than 200 ppm	
GP 4008	Deleted	
GP 4009	Asphyxiation	C
	Following a leak, a large cloud of propane gas forms above deck. Irrespective of the combustion hazard, is it dangerous to go above deck without a self-contained breathing apparatus?	
	A No, since propane is not a toxic gas	
	B No, since propane is not harmful to the lungs	
	C Yes, since propane displaces air and can also have an asphyxiating effect	
	D Yes, since propane is a toxic gas.	

Practice

Examination objective 5.1: Measuring gas concentration

Measuring devices

Number	*Source*	*Correct answer*
GP 5101		D
	Which device may be used to measure hydrocarbons in nitrogen?	
	A A flammable gas detector	
	B An oxygen meter	
	C A combined flammable gas detector/oxygen meter	
	D An infrared detector	
GP 5102		A
	Which device should be used to measure small concentrations of toxic gases in nitrogen?	
	A A toximeter	
	B A flammable gas detector	
	C. An oxygen meter	
	D An infrared detector	
GP 5103		B
	Which device should be used to measure small concentrations of toxic gases in air?	
	A An infrared detector	
	B A toximeter	
	C A flammable gas detector	
	D A combined flammable gas detector/oxygen meter	
GP 5104		C
	Which device is used to determine the oxygen content in a mixture of gases?	
	A A toximeter	
	B A flammable gas detector	
	C An oxygen meter	
	D An infrared detector	

Number	*Source*	*Correct answer*
GP 5105		D
	How is it determined whether a mixture of gases contains nitrogen?	
	A With an infrared detector	
	B With a flammable gas detector	
	C With a toximeter	
	D With none of the measuring devices mentioned above	
GP 5106		A
	With which device is it possible to establish beyond any doubt that a mixture of hydrocarbons and air is not explosive?	
	A With a combined flammable gas detector/oxygen meter	
	B With a flammable gas detector	
	C With a toximeter	
	D With an infrared detector	
GP 5107		B
	Which device should be used to determine the concentration of a flammable gas in air?	
	A An oxygen meter	
	B A flammable gas detector	
	C None of the devices mentioned enable this to be determined	
	D A toximeter	
GP 5108		C
	Which device should be used to measure the concentration of a gas known to be non-flammable but toxic?	
	A A flammable gas detector	
	B A combined flammable gas detector/oxygen meter	
	C A toximeter	
	D None of the devices mentioned above	
GP 5109		B
	An area filled with inert gas probably still contains residues of propane gas. How can this be established?	
	A With an oxygen meter	
	B With an infrared detector	
	C With a combined flammable gas detector/oxygen meter	

Number	*Source*		*Correct answer*
	D	With a flammable gas detector	
GP 5110			D
	You only have a toximeter at your disposal. You wish to enter an area. First you must measure the concentration in the area. For which of the following gases is the toximeter appropriate?		
	A	For UN No. 1010 1,2-BUTADIENE, STABILIZED	
	B	For UN No. 1086 VINYL CHOLORIDE	
	C	For UN No. 1280 PROPYLENE OXIDE	
	D	For none of these substances	

Practice

Examination objective 5.2: Measuring gas concentration

Use of measuring devices

Number	*Source*	*Correct answer*
GP 5201		A
	To measure the concentration of a toxic substance in an area, you use a test tube suitable for the purpose. After correctly making the measurements, you observe no discoloration of the contents. Which of the following statements is true?	
	A The test tube should not be used for any other measurements	
	B The test tube may immediately be reused for a second measurement in another area	
	C The test tube may eventually be reused provided it is kept in a refrigerator	
	D The test tube may eventually be reused provided it is closed with its original rubber stopper	
5202		D
	May a suitable test tube be used to measure the concentration of a toxic substance in an area if its use-by date has expired?	
	A Yes	
	B Yes, but only to obtain a preliminary result for the substance	
	C Yes, but only provided the correction factor contained in the instructions for use is applied	
	D No	
5203		A
	You use a test tube to measure low concentrations of gas. The test tube is graduated. After a set number of pumpings, the length of the coloured traces is noted. The test tube is graduated from 10 to 100 ppm; the number of pumpings is n=10. After five pumpings you observe that the discolouration indicates exactly 100 ppm. What do you conclude?	
	A The result is invalid and a test tube with a different range of concentrations should be used	
	B The concentration of gas is less than 100ppm	

Number	*Source*		*Correct answer*
	C	The concentration of gas is above 100ppm	
	D	The test tube is saturated, but the concentration is correctly indicated	
GP 5204			D
	You use a test tube to measure low concentrations of gas. The test tube is graduated. After a set number of pumpings the length of the coloured traces is noted. The test tube is graduated from 10 to 100 ppm; the number of pumpings is n=10. After 10 pumpings, you observe no discolouration. What do you conclude?		
	A	The result is invalid and a test tube with a different range of concentrations should be used	
	B	The instructions for use relating to application of a special correction factor should be consulted	
	C	The concentration of gas is higher than 100 ppm	
	D	The concentration of gas is less than 100 ppm	
GP 5205			A
	How do you establish that the bellows pump is airtight?		
	A	By inserting a closed test tube into the nozzle-tip after compressing the bellows	
	B	By inserting an open test tube into the nozzle-tip after compressing the bellows	
	C	By inserting a used test tube into the nozzle-tip and pumping 10 times	
	D	By inserting an upside-down test tube into the nozzle-tip and compressing the bellows	
GP 5206			D
	A combined flammable gas detector/oxygen meter gives the following results: oxygen 18%, “explosion” 50%. How do you interpret these results?		
	A	The “explosion” reading cannot be relied upon since the oxygen content is too low for combustion	
	B	The concentration of flammable gases is 50 volume per cent, i.e. above the lower explosive limit	
	C	The concentration of flammable gases is 50% of the lower explosive limit, but since the oxygen content is too low, the results are not clear	
	D	The concentration of flammable gases is 50% of the lower explosive limit. For a measurement made with a combined device, there is sufficient oxygen. The mixture is therefore not explosive, since the lower explosive limit has not been reached	

Number	*Source*	*Correct answer*
GP 5207		A
	A combined flammable gas detector/oxygen meter gives the following results: oxygen 8%, "explosion" 0%. How do you interpret these results?	
	A The "explosion" reading cannot be relied upon since the oxygen content is too low for combustion	
	B Since there is insufficient oxygen for combustion, the gas concentration reading of 0% is above the lower explosive limit	
	C The concentration of flammable gases is 0 volume per cent, therefore the mixture is not explosive	
	D The measuring device is defective	
GP 5208		A
	After determining the oxygen concentration, a reading of 50% is obtained with a flammable gas detector. What does this mean?	
	A The concentration of flammable gases is 50% of the lower explosive limit	
	B The concentration of flammable gases is 50% of the upper explosive limit	
	C The concentration of flammable gases is 50 volume per cent	
	D The concentration of oxygen is 50%	
GP 5209		B
	You have a flammable gas detector which operates in accordance with the principle of catalytic combustion. For which of the following substances should the device not be used in order not to damage the measuring apparatus?	
	A UN No. 1005 AMMONIA, ANHYDROUS	
	B UN No. 1063 METHYL CHLORIDE	
	C UN No. 1077 PROPYLENE	
	D. UN No. 1280 PROPYLENE OXIDE	
GP 5210	deleted	